REMARKS/ARGUMENTS

Favorable consideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-21 are pending in the application. Claims 1 - 3, 8, 9, 11-13, 18 and 21 have been amended. New Claims 22-25 have been added.

In the outstanding Office Action, Claims 1-8, 10-18 and 20 were rejected under 35 U.S.C. § 102(e) as being anticipated by Fawaz et al. (U.S. Patent No. 6,714,517 hereafter Fawaz); Claims 1-20 were rejected under 35 U.S.C. § 102(b) as being anticipated by "A Fast Restoration System for ATM-Ring-Based LANs" to May et al. ("May"); and Claim 21 is rejected under 35 U.S.C. § 102(b) as being anticipated by "Fault Tolerant Multiwavelength Optical Rings with Limited Wavelength Conversion" to Gerstel et al. ("Gerstel").

Each of the independent Claims 1, 11, and 21 have been amended to recite *inter alia* "broadcasting a failure condition signal." In addition, each the independent claims have been amended to clarify that the switch over occurs "in response to the failure condition signal." Further, Claims 1 and 21 have been amended to require a switch "residing within each of the network nodes . . .wherein a switch-over circuit within a network node of data packet insertion" switches data packets from one ring to another ring in response to the failure condition signal; and Claim 11 has been amended to recite "switching each of the packets at a point of insertion to an operational ring in response to the failure condition signal." Support for these amendments is found in the specification, page 9, lines 22-24, page 10, lines 50-25, and Figure 5. A person of ordinary skill in the art would understand from the detailed disclosure in the specification that an input node is a point of insertion.[1]

The dependent claims have been similarly amended to maintain correct antecedent basis. Further, dependent Claims 8 and 9 are corrected to properly read as apparatus claims.

[1] Specification, page 10, lines 15-25, Figure 5.

New Claims 22-25 depend directly or indirectly from Claim 1 and respectively recite *inter alia* "at least one input port module which accepts an incoming flow and classifies each incoming flow with a classifier circuit; and a separate switch-over circuit coupled to each input port module"; "a separate buffer for each incoming flow that queues the incoming flow data"; "a rate controller configured to vary an output data rate of the separate buffer"; and "an output data buffer configured to queue and rate shape an output data." Each of these New Claims has support in the Specification on pages 16 and 17. Thus, no new matter is added.

Briefly recapitulating, Claim 1 recites *inter alia* a bi-directional flow-switched ring with "a detector residing within each of the network nodes which detects a failure in a segment of either of the first ring and second ring and broadcasts a failure condition signal to the plurality of network nodes; and a switch-over circuit residing within each of the network nodes wherein the switch-over circuit within a network node of data packet insertion switches data packets from one ring to another ring in response to the failure condition signal." Presently amended independent Claim 11, an alternative embodiment of Applicants' invention, also recites "detecting when a failure has occurred in a segment of either of the first ring or the second ring; broadcasting a failure condition signal to the plurality of switching devices; and switching a packet at a point of insertion to an operational ring in response to the failure condition signal." And presently amended independent Claim 21 also recites "a switch residing within each of the network nodes wherein the switch within a network node of data packet insertion redirects data packets from a first lambda to a second lambda in response to the failure condition signal." Thereby, the presently claimed invention immediately redirects data packets affected by a failure.

On the other hand, in the basic loop back failure recovery scheme a data packet would necessarily have to travel through several nodes and segments before being looped back through a different ring. This longer distance and switching overhead increases the associated

delay in re-routing a data packet in the case of failure, and it can take up to one second to restore a packet. In some applications (e.g. e-mail), this delay is negligible, but it is totally unacceptable for real time applications. Therefore, the presently claimed packet networks, upon detection of a failure, immediately redirect flows affected by the failure.[2] In a preferred embodiment, the input node, or point of insertion, being aware of the failure or congestion, sends the packet via the most favorable ring based on the packet's destination.[3]

Gerstel describes fault tolerant multiwavelength optical rings with limited wavelength conversion. In particular, Gerstel describes a low cost solution to the fault tolerance problem where "[upon] detection of a channel failure, the switches in the node switch the data from the failed channel to the backup channel."[4] From the descriptions in Gerstel it is to be understood that a channel refers to a select wavelength of light in a single fiber.[5] Second, Gerstel describes the management of channel and link faults by "for example when a link failure occurs, the two nodes at the ends of the failed link sense the failure, check their local *EnableLink[i]* flags and for each I for which the flag is on, execute the line protection scheme. The two nodes then inform the GME about the event and the GME sets the local flags at all the nodes. This slower global coordination by the GME is adequate as long as two failures do not occur very close to each other (which is not expected to be the case)."[6] Thus, Gerstel fails to disclose or suggest the broadcast of a failure condition signal to the plurality of network nodes.

Gerstel considers "WDM ring networks with limited wavelength conversion capabilities in each node."[7] But Gerstel does not disclose or suggest a switch-over circuit

[2] Specification, page 10, lines 10-13.
[3] Id., lines 15-25, Figure 5.
[4] Gerstel, §2.1
[5] Gerstel, §1.2
[6] Gerstel, §3.1, paragraph 4.
[7] Gerstel, §4, paragraph 1.

within a network node of data packet insertion that switches data packets from one ring to another ring in response to the failure condition signal.

In contrast to Gerstel, each of the switches of the presently claimed inventions redirects packet flows affected by the failure at the point of insertion. In addition, the presently claimed invention broadcast a failure condition signal to each of the nodes.

May describes a fast restoration system for ATM ring based LANs where a "dual homing techniques is used to protect the interconnection of multiple rings."[8] If a node failure is detected, "the detecting node has to notify the other nodes. This is done by a dedicated message that is broadcast to all other nodes."[9] This "restoration algorithm is fast because for a simplex link failure **only one node has to react** to the failure for performing the rerouting."[10] Thus, May teaches away from the presently claimed invention where "**each** of the network nodes . . . switches data packets at a point of insertion from one ring to another ring in response to the failure condition signal."

Further, May is an example of the basic loop back structure discussed *supra*. Indeed, May states that the "failure can then be restored by rerouting the protected traffic that should be normally sent from B to C to the other ring output of node B that leads to node A in this case. We call the associated ring inlet of node B now being in *loopback mode*."[11] (emphasis in original). In contrast to May, each of the switches of the presently claimed inventions redirects packet flows affected by the failure at the point of insertion.

Similar to May, the Fawaz reference describes a method and apparatus for interconnection of packet switches with guaranteed bandwidths. Fawaz describes one embodiment of a basic loop back structure network wherein "in case of failure, the network

[8] May, page 90, column 2, second full paragraph.
[9] May, page 96, column 2, second full paragraph.
[10] May, page 91, column 1, first paragraph.
[11] May, page 94, "Reaction to Link and Node Failures"; Figures 5 -7.

reconfigures itself from a dual ring into a single logical working ring."[12] To detect failure, QoS nodes on the ring monitor incoming data streams and if the "incoming stream to node M stops on the link from node M-1, as shown in FIG 13b," then the QoS nodes cycle a message through the loop to confirm the failure.[13] Thus, Fawaz does not disclose or suggest the broadcast of a failure condition signal to the plurality of network nodes.

Second, Fawaz describes that the ring is then reconfigured as shown in Fig. 13b, "such that a single ring is formed using the dual links."[14] Thus, Fawaz does not describe or suggest a switch-over circuit within a network node of data packet insertion that switches data packets from one ring to another ring in response to the failure condition signal. In contrast to Fawaz, each of the switches of the presently claimed inventions redirect flows affected by the failure at the point of insertion to the secondary ring in response to a broadcast failure condition signal.

As none of the cited prior art, individually or in combination, disclose or suggest all the elements of the presently amended independent Claims 1, 11, or 21, Applicants submit the inventions defined by independent Claims 1, 11, or 21, and all claims depending therefrom, are not anticipated nor rendered obvious by the asserted references.[15]

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[12] Fawaz, column 13, lines 13-15.
[13] Fawaz, column 13, lines 30-39.
[14] Fawaz, column 13, lines 40-43.
[15] MPEP § 2142 requires that "the prior art reference (or references when combined) must teach or suggest **all** the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)."

Accordingly, in view of the present amendment and in light of the previous discussion, Applicants respectfully submit that the present application is in condition for allowance and respectfully request an early and favorable action to that effect.

Respectfully submitted,

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